Geophysical Research Abstracts
Vol. 12, EGU2010-3077, 2010
EGU General Assembly 2010

Do erosion pins measure net ecosystem respiration or soil erosion – baklancing fluxes for an eroding peatland

Fred Worrall (1), James Rowson (2), and Martin Evans (3)

(1) University of Durham, Earth Sciences, Durham, United Kingdom (fred.worrall@durham.ac.uk), (2) Manchester Metropolitan University, Environmental Sciences, Manchester, UK, (3) University of Manchester, Geography, Manchester, UK

The upland peat soils of the UK are the country's singlest largest terrestrial carbon store. Unlike many peatlands in the World those of the UK are highly damaged and intensely managed and because of this fluxes of particulate organic carbon (POC) represent a larger proportion of the carbon budget than would otherwise be the case. A common approach to the measurement of particulate loss is the use of networks of erosion pins but surface recession as measured by erosion pins is an integrated measure of a number of processes and fluxes. Therefore, can we assess whether erosion pins are measuring erosion, and thus particulate loss, or whether they reflect such processes as loss via soil respiration.

As part of ongoing research into the benefit of restoring damaged peatlands grids of erosion pins have been monitored annually across 8 sites for the last 3 years. At the same site measures of gaseous exchange have been monitored monthly. The detailed gas analysis includes, net ecosystem respiration, net ecosystem exchange and gross primary productivity. The gaseous measurements were taken alongside monitoring of other environmental drivers which include: soil/air temperature; photosynthetically active radiation (PAR); and depth to water table.

The survey of erosion pins has found significant differences between sites with some sites showing significant surface loss and others surface accumulation. The study has shown that it is possible to separate out contributions to the gaseous exchange and thus estimate the actual soil respiration for any site, and thus explain how much of the surface loss measurements is due to erosion.